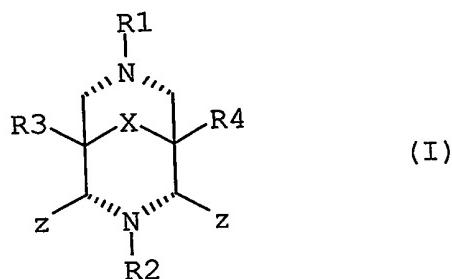


- 35 -

**We claim:**

1. A bleaching composition comprising:

5 a) a monomer ligand, L, or transition metal catalyst thereof  
of a ligand having the formula (I):



10 wherein R1 and R2 may be selected from the group consisting  
of:  
a group containing a heteroatom capable of coordinating to a  
transition metal;  
a -C1-C22-optionally substituted-alkyl;  
15 a -C6-C10-aryl;  
a -C1-C4-alkyl-C6-C10-aryl; and,

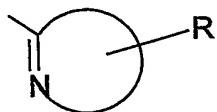
wherein at least one of R1 and R2 is a non-aromatic  
hydrocarbon group, the non-aromatic hydrocarbon group being  
20 a C8-C22-alkyl chain;

R3 and R4 are independently selected from: hydrogen, C1-C4-  
alkyl, phenyl, electron withdrawing groups and reduced  
products and derivatives thereof;

- 36 -

X is selected from: C=O, a ketal derivative of C=O, a thioketal of derivative of C=O, and  $-[C(R_6)_2]_y-$  wherein y takes a value 0 or 1; each R<sub>6</sub> is independently selected from hydrogen, hydroxyl, O-C<sub>1</sub>-C<sub>24</sub>-alkyl, O-benzyl, O-(C=O)-C<sub>1</sub>-C<sub>24</sub>-alkyl, and C<sub>1</sub>-C<sub>24</sub>-alkyl;

5 z groups are same monocyclic or dicyclic heteroaromatic N-



wherein R is -C<sub>0</sub>-C<sub>4</sub>-

donor groups of the form:  
alkyl, and,

10

b) the balance carriers and adjunct ingredients.

2. A bleaching composition according to claim 1, wherein the group containing a heteroatom capable of coordinating to  
15 a transition metal is selected from the group consisting of: an optionally substituted tertiary amine of the form -C<sub>2</sub>-C<sub>4</sub>-alkyl-NR<sub>7</sub>R<sub>8</sub>, in which R<sub>7</sub> and R<sub>8</sub> are independently selected from the group consisting of straight chain, branched or cyclo C<sub>1</sub>-C<sub>12</sub> alkyl, benzyl, the -C<sub>2</sub>-C<sub>4</sub>-alkyl- of the -C<sub>2</sub>-C<sub>4</sub>-alkyl-NR<sub>7</sub>R<sub>8</sub> may be substituted by 1 to 4 C<sub>1</sub>-C<sub>2</sub>-alkyl, or may  
20 form part of a C<sub>3</sub> to C<sub>6</sub> alkyl ring, and in which R<sub>7</sub> and R<sub>8</sub> may together form a saturated ring containing one or more other heteroatoms;  
a heterocycloalkyl: selected from the group consisting of:  
25 pyrrolinyl, pyrrolidinyl, morpholinyl, piperidinyl, piperazinyl, hexamethylene imine, 1,4-piperazinyl, tetrahydrothiophenyl, tetrahydrofuranyl, tetrahydropyranyl, and oxazolidinyl, wherein the heterocycloalkyl may be

- 37 -

connected to the ligand via any atom in the ring of the selected heterocycloalkyl;

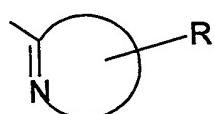
a -C1-C6-alkyl-heterocycloalkyl, wherein the heterocycloalkyl of the -C1-C6-alkyl-heterocycloalkyl is

5 selected from the group consisting of: piperidinyl, piperidine, 1,4-piperazine, tetrahydrothiophene, tetrahydrofuran, pyrrolidine, and tetrahydropyran, wherein the heterocycloalkyl may be connected to the -C1-C6-alkyl via any atom in the ring of the selected heterocycloalkyl;

10 and,  
a -C1-C6-alkyl-heteroaryl, wherein the heteroaryl of the -C1-C6-alkyl-heteroaryl is selected from the group consisting of: pyridinyl, pyrimidinyl, pyrazinyl, triazolyl, pyridazinyl, 1,3,5-triazinyl, quinolinyl, isoquinolinyl, 15 quinoxalinyl, imidazolyl, pyrazolyl, benzimidazolyl, thiazolyl, oxazolidinyl, pyrrolyl, carbazolyl, indolyl, and isoindolyl, wherein the heteroaryl may be connected to the -C1-C6-alkyl via any atom in the ring of the selected heteroaryl and the selected heteroaryl is optionally substituted by a group selected from the group consisting of

20 a -C1-C4-alkyl, -C0-C6-alkyl-phenol, -C0-C6-alkyl-thiophenol, -C2-C4-alkyl-thiol, -C2-C4-alkyl-thioether, -C2-C4-alkyl-alcohol, -C2-C4-alkyl-amine, and a -C2-C4-alkyl-carboxylate.

25 3. A bleaching composition according to claim 1 or 2, wherein z groups are same heteroaromatic groups of the form:



selected from the group consisting of:

pyridinyl; quinolinyl, pyrazolyl, imidazolyl;

- 38 -

benzimidazolyl; and thiazolyl, and wherein R is -C0-C4-alkyl.

4. A bleaching composition according to claim 3, wherein z  
5 is pyridinyl optionally substituted by -C0-C4-alkyl.

5. A bleaching composition according to any one of claims  
1 to 4, wherein at least one of R1 and R2 is a non-aromatic  
hydrocarbon group, the non-aromatic hydrocarbon group being  
10 a C10-C20 alkyl chain.

6. A bleaching composition according any preceding claim,  
wherein one of R1 and R2 is selected from the group  
consisting of: Me, CH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub>, and pyridin-2-ylmethyl, wherein  
15 the pyridin-2-ylmethyl is optionally substituted by C1-C4-alkyl.

7. A bleaching composition according to claim 6, wherein  
one of R1 and R2 is a pyridin-2-ylmethyl that is optionally  
20 substituted by C1-C4-alkyl.

8. A bleaching composition according to any one of claims  
1 to 6, wherein one of R1 and R2 is selected from the group  
consisting of:  
25 an optionally substituted tertiary amine of the form -C<sub>2</sub>-C<sub>4</sub>-alkyl-NR<sub>7</sub>R<sub>8</sub>, in which R<sub>7</sub> and R<sub>8</sub> are independently selected  
from the group consisting of straight chain, branched or  
cyclo C<sub>1</sub>-C<sub>12</sub> alkyl, -CH<sub>2</sub>-C<sub>6</sub>H<sub>5</sub>, wherein the C<sub>6</sub>H<sub>5</sub> is  
optionally substituted by -C1-C4-alkyl or -O-C1-C4-alkyl,  
30 and pyridin-2-ylmethyl wherein the pyridine is optionally  
substituted by C1-C4-alkyl, the -C<sub>2</sub>-C<sub>4</sub>-alkyl- of the -C<sub>2</sub>-C<sub>4</sub>-

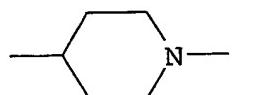
- 39 -

alkyl-NR<sub>7</sub>R<sub>8</sub> may be substituted by 1 to 4 C1-C2-alkyl, or may form part of a C3 to C6 alkyl ring, and in which R<sub>7</sub> and R<sub>8</sub> may together form a saturated ring containing one or more other heteroatoms.

5

9. A bleaching composition according to claim 8, wherein the optionally substituted tertiary amine of the form -C3-alkyl-NR<sub>7</sub>R<sub>8</sub>.

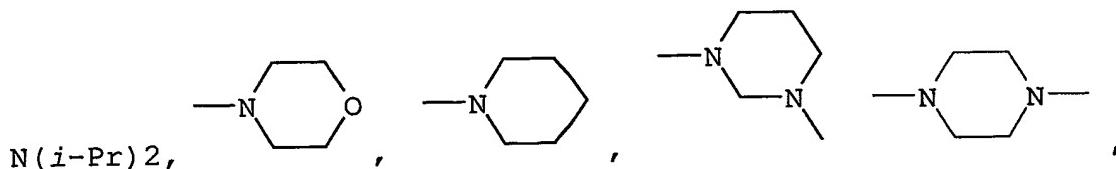
10 10. A bleaching composition according to claim 9, wherein



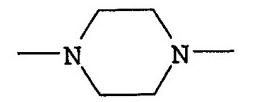
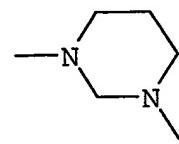
the -C3-alkyl-NR<sub>7</sub>R<sub>8</sub> is .

11. A bleaching composition according to claim 8, wherein the optionally substituted tertiary amine of the form -C2-alkyl-NR<sub>7</sub>R<sub>8</sub>.

12. A bleaching composition according to claim 8, wherein -NR<sub>7</sub>R<sub>8</sub> is selected from group consisting of: -NMe<sub>2</sub>, -NEt<sub>2</sub>, -



N(i-Pr)<sub>2</sub>,



20 and .

13. A bleaching composition according to any preceding claim, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of: -C(O)O-C1-C24-alkyl, -C(O)-O-C1-C24-aryl -

25 CH<sub>2</sub>OOC(O)C1-C20-alkyl, benzyl ester, phenyl, benzyl, CN,

- 40 -

hydrogen, methyl, and C<sub>1</sub>-C<sub>4</sub>-OR wherein R is selected from the group consisting of H, C<sub>1</sub>-C<sub>24</sub>-alkyl or C(O)-C<sub>1</sub>-C<sub>24</sub>-alkyl.

5 14. A bleaching composition according to claim 13, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of -CH<sub>2</sub>OH, -C(O)-O-CH<sub>2</sub>C<sub>6</sub>H<sub>5</sub> and -C(O)O-C<sub>1</sub>-C<sub>6</sub>-alkyl.

10 15. A bleaching composition according to claim 14, wherein R<sub>3</sub> and R<sub>4</sub> are selected from the group consisting of: -C(O)-O-CH<sub>3</sub>, -C(O)-O-CH<sub>2</sub>CH<sub>3</sub>, -C(O)-O-CH<sub>2</sub>C<sub>6</sub>H<sub>5</sub> and CH<sub>2</sub>OH.

15 16. A bleaching composition according to any preceding claim, wherein: R<sub>3</sub> = R<sub>4</sub>.

17. A bleaching composition according to any preceding claim, wherein X selected from the group consisting of: C=O, CH<sub>2</sub>, C(OH)<sub>2</sub>, syn-CHOR and anti-CHOR, wherein R is H, C<sub>1</sub>-C<sub>24</sub>-alkyl or C(O)-C<sub>1</sub>-C<sub>24</sub>-alkyl.

20 18. A bleaching composition according to claim 17, wherein X is C=O or C(OH)<sub>2</sub>.

19. A bleaching composition according to claim 18, wherein 25 X is C=O.

20. A bleaching composition according to claims 1 to 19, wherein the complex is of the general formula (A1):

- 41 -

in which:

M represents a metal selected from Mn(II)-(III)-(IV)-(V), Cu(I)-(II)-(III), Fe(II)-(III)-(IV)-(V), Co(I)-(II)-(III), Ti(II)-(III)-(IV), V(II)-(III)-(IV)-(V), Mo(II)-(III)-(IV)-(V)-(VI) and W(IV)-(V)-(VI);

X represents a coordinating species selected from any mono, bi or tri charged anions and any neutral molecules able to coordinate the metal in a mono, bi or tridentate manner;

Y represents any non-coordinated counter ion;

a represents an integer from 1 to 10;

k represents an integer from 1 to 10;

n represents an integer from 0 to 10;

m represents zero or an integer from 1 to 20; and

L represents a ligand as defined in claims 1 to 19, or its protonated or deprotonated analogue.

21. A bleaching composition according to claim 20, wherein M represents a metal selected from Fe(II)-(III)-(IV)-(V).

20 22. A bleaching composition according to claim 21, wherein M represents a metal selected from Fe(II) and Fe(III).

23. A bleaching composition according to claim 22, wherein  
25 the ligand is present in the form selected from the group consisting of [FeLC1]Cl ; [FeL(H2O)](PF6)2; [FeLCl]PF6 and [FeL(H2O)](BF4)2.